

# THE FUNCTION OF THE KIDNEYS

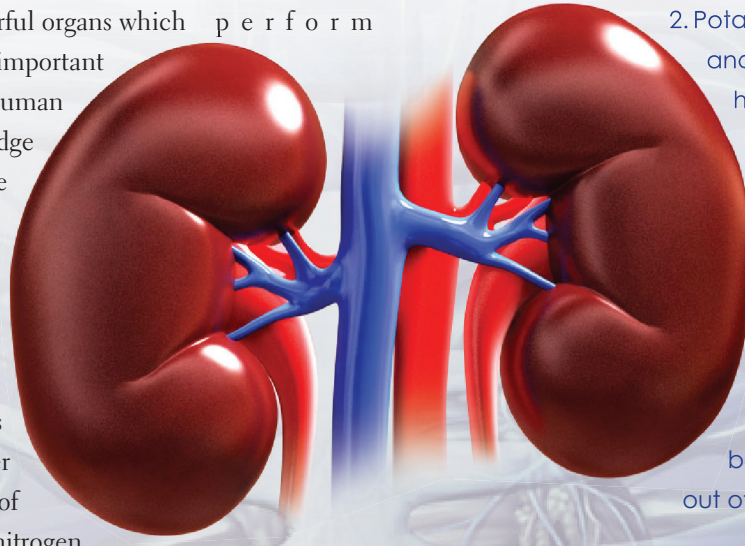
By Dr. Elliot O. Douglin

The kidneys are wonderful organs which perform several critically important functions in the human body. It is common knowledge that the kidneys clean the blood. They remove metabolic wastes and toxic substances from the blood as it flows through the kidneys. Perhaps the best known substance excreted by the kidneys is urea. Urea is made in the liver from the breakdown products of protein metabolism. These nitrogen containing (NH<sub>2</sub>) groups would form ammonia which is toxic but the liver converts the ammonia to urea via arginine and citrulline. The urea is nontoxic and is excreted by the kidneys. Other less well known toxic molecules are also excreted by the kidneys.

In addition to excreting metabolic toxic waste substances, the kidneys perform a number of "housework" or regulatory or homeostasis functions. Here is a list:-

1. *Excretion of acid*
  2. *Reclaiming bicarbonate*
- } THESE 2 FUNCTIONS  
*Regulate acid-base balance in our bodies.*
3. *Maintaining water and electrolyte homeostasis balance. The kidneys can get rid of excess sodium chloride, excess potassium and excess water. This is vital.*
  4. *The kidneys produce the active form of Vit. D<sub>3</sub> called biochemically 1,25- Dihydroxycholecalciferol. This is necessary for the regulation of calcium levels in the blood and for bone structure.*
  5. *They also produce a hormone call ERYTHROPOIETIN which stimulates the bone marrow to make blood (red blood cells). When the kidneys fail the following disturbances will occur and if not dealt with will be fatal.*

1. Retention of impurities which makes the patient feel sick and "dirty" causing nausea and vomiting, fatigue and weakness.



2. Potassium levels rise in the blood and if not corrected will stop the heart.
3. Overload of salt and water can occur and can cause heart failure.
4. The Blood Pressure rises
5. The patient becomes anaemic.
6. The patient loses calcium, causing certain hormones and bone metabolism to be thrown out of balance.

We tend to take the kidneys for granted but ask anyone with end-stage kidney failure how important the kidneys are!

## OUTLINE OF KIDNEY STRUCTURE

The functional unit of the kidney is the NEPHRON which is made up of the glomerulus and a system of tubules.

The glomerulus contains a network of capillaries lined with and supported by important cells called epithelial cells and mesangial cells. The important function of the glomerulus is to filter the blood passing through its capillaries. The filtrate has to pass across, what is called, the glomerular filtration barrier, G.F.B. The G.F.B. has a layer of endothelial cells on the inside, a basement membrane in the middle and special foot-processes of the epithelial cells on the outside.

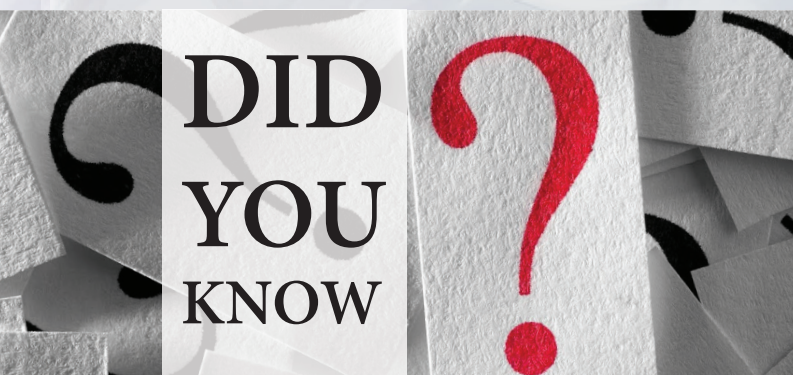
The basement membrane itself is very complex and consists of 3 layers of which the centre layer is electron rich.

Diseases like diabetes and hypertension cause derangement of the G.F.B. by damaging the endothelial capillary lining and the basement membrane. This damage will reduce the filtration rate leading to kidney failure. Immune disorders cause inflammation which also damage the basement membrane or cause abnormal proliferation of the epithelial or mesangial cells in the glomerulus.

Antioxidant rich diets help to maintain the electron richness of the basement membrane and also help to protect the inner lining (endothelium) of the capillaries.

## THE TUBULAR SYSTEM

After the glomerulus we come to the tubular system. The first tubule leaving the glomerulus is called the Proximal Convolute Tubule (PCT) which is responsible for reabsorbing good substances (like water, glucose, electrolytes and bicarbonate) from the filtrate. After the PCT is the system of tubules called the loops of Henle (after the anatomist who discovered them a long time ago). These loops play a critical role in salt and water balance. Thereafter there is the Distal Convolute Tubule where delicate and intricate adjustments are made to sodium and potassium balance under the influence of a hormone called aldosterone. Then finally there is the Collecting Duct System where under the influence of another hormone (Anti Diuretic Hormone) final adjustments are made to the concentration of the urine. 🌿



- The kidneys not only produce urine but also produce hormones, absorb minerals and filter the blood.
- Kidneys help to regulate blood pressure by producing the hormone renin.
- The kidneys produce a hormone called erythropoietin (EPO) which aids in the making of red blood cells.
- The kidneys regulate the amount of water in the blood. When you drink a lot of water the kidneys excrete more water in your urine. However, when your water intake is low, the kidneys produce a more concentrated, and hence darker, urine.
- Regular use of certain painkillers can negatively affect your kidney function. It is always good to consult your doctor for information about the risks associated with certain medications.
- High blood pressure and diabetes are the two leading causes of kidney disease. Managing these conditions also helps protect your kidneys.
- Normal urine output is between 800 and 2,000 ml per day.
- Each kidney is made up of about a million filtering units called nephrons. The nephron includes a filter, called the glomerulus, and a tubule.

## THE PREVENTION OF CHRONIC KIDNEY DISEASE

By Dr. Elliot O. Douglin

The kidney is a master piece of Infinite Wisdom. We are indeed fearfully and wonderfully made.

**CHRONIC KIDNEY DISEASE (CKD) IS A SILENT KILLER.** It develops gradually over a relatively long period of time. What happens is that there is a slowly progressive irreversible loss of kidney function. Although many conditions can cause kidney damage the two most common causes are diabetes and hypertension.

Symptoms of CKD only develop after more than 75-80% of kidney function has been irreversibly lost. This means that if you are at risk you should get your kidney function evaluated about once per year so as to detect early damage and receive appropriate medical management.

### BARBADOS STATISTICS

The annual CKD mortality rate per 100 000 people in Barbados has risen by 51.7% since 1990, this is equivalent to an average of 2.2% increase per year since 1990. The mortality rate (deaths per 100 000) for CKD in Barbados is around 26.4.

### REGIONAL STATISTICS (2013)

Trinidad and Tobago has the highest CKD mortality rate of 29.2 deaths per 100 000 per year. St. Vincent and the Grenadines has the lowest at 19.7 per 100 000 per year.

COUNTRY	MORTALITY RATE
T & T	29.2
BAHAMAS	27.6
SURINAME	27.3
BARBADOS	26.4
DOMINICA	25.9
JAMAICA	22.5
GRENADA	22.5
ST. LUCIA	22.5
ANTIGUA & BARBUDA	20.1
ST. VINCENT	19.7

### GLOBAL STATISTICS

10% of the worldwide population is affected by CKD and millions die each year because they do not have access to affordable treatment in their particular country. All over the world there has been a steady rise in CKD mortality since 1990. Over 2 million people worldwide receive treatment with dialysis or a kidney transplant to stay alive, but this number maybe only 10% of total persons with CKD. The remaining 90% do not receive adequate medical diagnosis or management.

## COST OF CARE

The treatment of CKD is very costly. In USA it exceeds 48 billion USD per year. In the U.K a recent NHS Report indicates that CKD costs more than breast, lung, colon, and skin cancer combined. In Barbados one treatment of hemodialysis is \$459 - \$613.

CKD is a global health crisis.

## RELATION TO AGE

Between age 65 to 74 years it is estimated that 1 in 5 men and 1 in 4 women have CKD.

## MAIN CAUSES

By far the two most common causes are Diabetes mellitus and hypertension. Immunologic inflammation of the glomerulus (glomerulonephritis) and auto immune disease, like lupus, are also significant causes of CKD. Obesity is now recognised as a risk factor for CKD.

Remember, too, that the aging process takes a toll on kidney function, so that most cases of CKD are found in the over 65 age groups.

Lastly, in a small but significant proportion of CKD, no identifiable cause can be found.

## TESTS FOR CKD

One of the earliest indicators of kidney damage is the leaking of a very small amount of protein (albumin) into the urine. This is called micro albuminuria. At this stage vigorous medical intervention can reverse damage.

Other tests include estimating the filtering power of the kidneys by a test called the glomerular filtration rate (GFR). This is used to stage the CKD. A GFR of 100 or more is considered normal, when it falls to 10 or less it indicates End Stage Renal Disease and the need for dialysis or kidney transplant.

## PREVENTION

The prevention or strict control of obesity, diabetes and hypertension would be the most important approach to prevent CKD.

## PRIMARY PREVENTION

Primary prevention aims at reducing risk factors so as to prevent the disease. Here is a list of 12 key primary prevention strategies

1. *Avoid Tobacco*
2. *Avoid Alcohol*
3. *Reduce salt intake*

4. *Drink more water*
5. *Avoid sugar and sugary drinks*
6. *Eat more fruit*
7. *Eat more vegetables, especially green leafy vegetables.*
8. *Get more protein from plant sources (peas, beans, grains)*
9. *Eat low fat, high fibre foods*
10. *Moderate Exercise balanced by 7 to 8 hours of sleep at night.*
11. *Maintain ideal body weight*
12. *Beware of the NSAID pain killers e.g. diclofenac, Ibuprofen etc.*

NSAID are particularly dangerous in the elderly and those who have long standing diabetes or hypertension.

## SECONDARY PREVENTION

SECONDARY PREVENTION means early detection strategies to detect the earliest development of a disease at a stage when it can be reversed.

People at risk (diabetes, hypertension, obesity, lupus, family history of CKD) should get a micro albuminuria (urine protein) test and glomerular filtration rate done yearly. But of even greater importance is the strict control of diabetes and hypertension and the life style changes already mentioned.

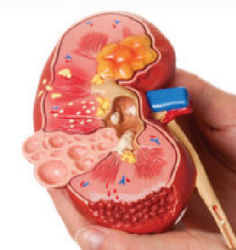
## TERTIARY PREVENTION

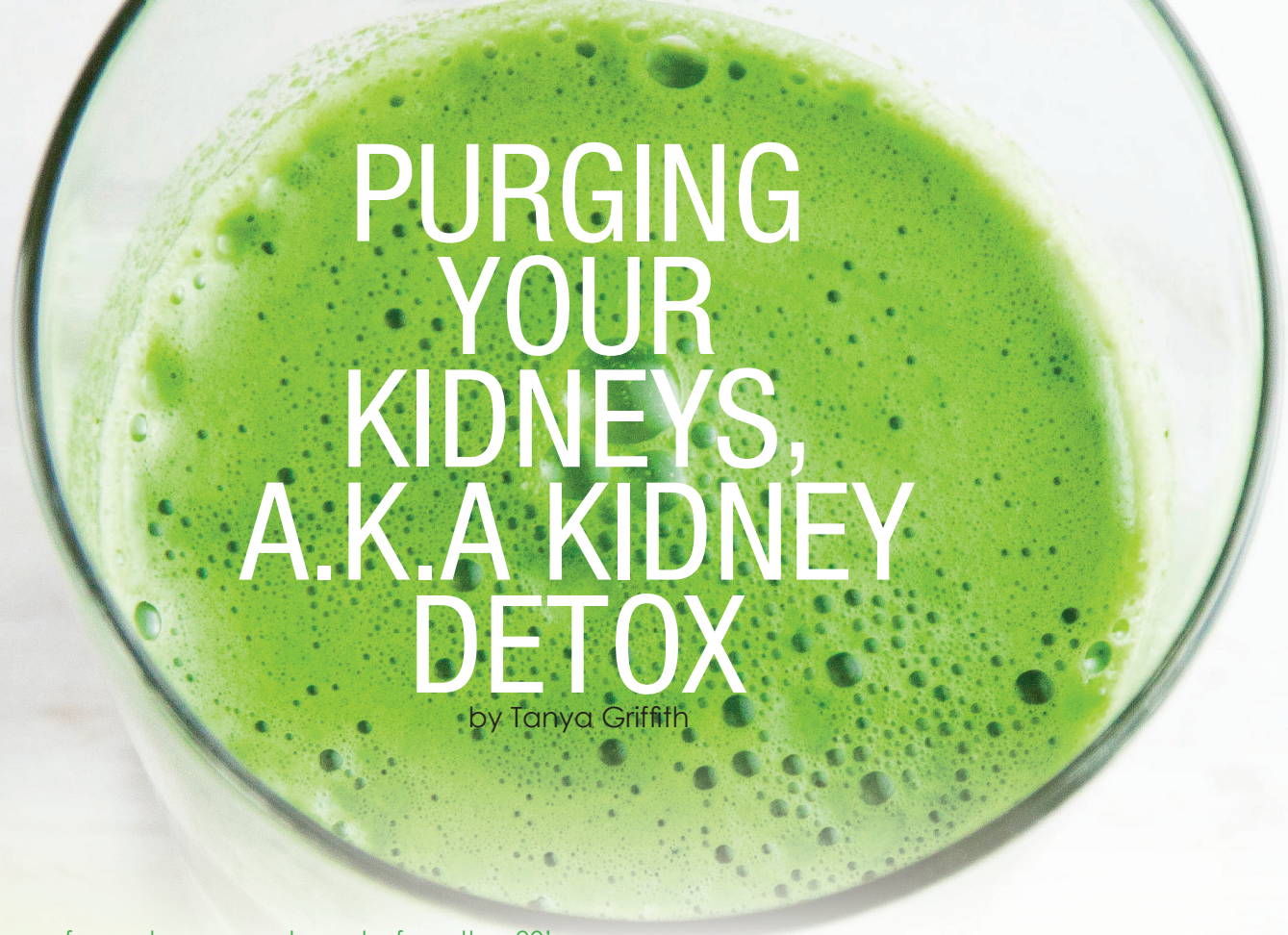
Once CKD has progressed beyond Stage III it is a matter of "damage control". This requires medical treatment to slow the rate of decline in kidney function and involves referral to a Nephrologist.

## SUMMARY

The lifestyle of vigorous primary prevention coupled with annual early detection tests must be the best approach for CKD prevention.

Healthy eating, exercise, prevention of obesity, diabetes and hypertension are foundational to any prevention strategy. 🌿





# PURGING YOUR KIDNEYS, A.K.A KIDNEY DETOX

by Tanya Griffith

Many of us who were born before the 90's probably might have experienced our grandparents or elderly aunt purging themselves and insisting that we take some of that bush tea for a purging. Many of us might have turned up our noses, scoffed at these old wives' remedies or hid away so that we would not fall prey to such things.

Today, modern medicine is beginning to catch up to our granny and old aunts and uncles who insisted on purging our bodies from all of the toxins that had built up in them over time.

Today, we don't call it purging, but rather, many of us refer to it as detoxing.

Whatever we choose to call it, we need to take time to get rid of the toxins that have built up in our bodies. Here are simple recipes for cleansing the kidneys:

- DETOX JUICE**
- Two lemons (peeled and seeded)
  - A quarter of a cucumber
  - One and a half apples
  - Two celery stalks

Place the ingredients one at a time, starting with the lemon, in your juicer or food processor. Blend until smooth, then stir and drink.



## LEMON

Contains natural citrate which can help to prevent kidney stones. Also helps with bowel movements.



## CUCUMBER

Help regulate uric acid which helps to prevent certain kidney stones



## APPLES

Contain pectin which is a soluble fibre that helps lower cholesterol. Cholesterol can block renal arteries which can negatively affect the kidney



## CELERY

Alkalizes the body which can help prevent and even reverse kidney disease. Alkaline diet reduces the risk of kidney stones.

**BLAST FROM THE PAST**  
 Many of the elderly people in Barbados grew up very poor. Much of their food included drinking readily available things like lemonade and using "bush tea" to help stave off many illnesses. Today we are beginning to realize that much of the "bush tea" and locally sourced foods have tremendous health benefits.

There are several herbs that can be used to help maintain kidney health and help cleanse the kidneys. We will focus on a few herbs that grow locally in Barbados.



## STINGING NETTLE

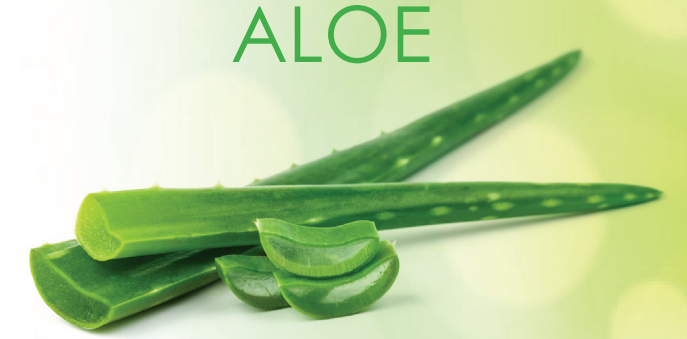
High in vitamin C. It is a diuretic and therefore helps the kidneys filter out excess liquid in the body. Used to treat urinary tract infections and treat other kidney problems.

## SEED ON THE LEAF



Known as the stone breaker herb in other countries, Seed on the Leaf is used to treat kidney stones. It is also used to treat kidney pain, UTI and kidney swelling.

It is a diuretic herb and will remove water, salt and other toxins through urination.



## ALOE

Aloe lowers the blood sugar level and thereby reduces diabetes related kidney damage. It contains auxins and gibberellins that give it its anti-inflammatory, anti-septic and anti-bacterial properties. Due to these it helps reduce the risk of kidney infection.

**SABBATH SERVICES**  
 9:30am – 11:15am:  
 Song Service, Devotion, Sabbath-School & Divine Hour  
 3:30-Sunset  
 Song Service, followed by varied program  
 (Health Talks, Family Lectures, Bible Studies, Youth Forum, & Outreach)

**SUNDAY**  
 6:00pm - 7:00pm:  
 Bailey's Hill, Redman's Village, St Thomas

**WEDNESDAY**  
 7:15pm- 8:30pm: (Prayer Meeting)  
 Bailey's Hill, Redman's Village, St Thomas

# Juice Up Life! Get Healthy! RAW & LIVING FOODS FOR LIFE!

by Althea Foster

Our bodies are made up of over 100 trillion living cells, and at creation the prescription for the healthy maintenance of these living cells was given, by our Creator.

Genesis 1: 29 "Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat."

Our diet today has little resemblance to the original one. Do you think the food we eat plus other factors such as lack of exercise, not drinking enough water, improper cleansing of the colon, stress, and little rest contributes to the poor state of health in the world today? It certainly does.

Human beings are the only species on earth that destroys that which gives life; consuming dead food and killing enzymes by cooking them. Cooking food, kills it by destroying the enzymes.

Enzymes are the catalyst that makes cells function effectively. They make life possible by repairing and building the body. Our bodies require enzymes for every single activity. Enzymes make the liver, kidney, digestive system, eyes, lungs, heart, and every organ function.

Now let us address the differences between raw foods and living foods. Raw foods are those picked off trees or vines, such as mangoes, squash, golden


apples, tomatoes, etc.

Living foods are grains, beans, nuts, seeds, and berries that have been soaked or sprouted. When the sprout comes out of soaked grain or seeds, it becomes a "living food" full of life and increased nutritional value. Remember Daniel's ten day diet of pulses and water; the pulses he ate were sprouted grains, seeds, and nuts; living food, food with the pulse of life in it. (Read Daniel 1:8-16)

We are starving our bodies on a cellular level with cooked food, so we tend to eat more and more. We are hungry all the time, and we are never satisfied.

Begin adding some raw and living foods to your diet and reduce some of the dead cooked foods and feel the difference in your body when it's being nourished on a cellular level. You will not be as hungry, your energy levels will increase, and you will not crave processed foods as much.

Our bodies are self-healing and disease can be reversed as we consistently build the immune system through superior nutrition and a healthy lifestyle.

No Seed! No Life! No Science of Life! 



## Living Lentil Sprouts

by Althea Foster




### INGREDIENTS:

Lentil Peas

### DIRECTIONS:

1. Wash lentil peas and soak in water overnight for 6-8 hours.
2. Drain off water and rinse.
3. Place in glass bottle or container and cover the mouth of the container with mesh, and secure with a rubber band.
4. Turn the container at a 45° angle and place on a drain rack.
5. Rinse in the morning and evening with fresh water, draining off the water and turning the container at a 45° angle. Don't let the peas cover the entire mouth of the container. Sprouts need air circulation.
6. When the tail sprouts ¼", rinse, drain, and use immediately or refrigerate for later use.
7. They will continue to grow in the refrigerator.
8. Use in salads or liquid vegetable soups.

Chopped tomatoes, onions, shredded cabbage, olive oil, sea salt, and cayenne pepper makes a delicious raw and living salad. 

## Fresh Vegetable Juice Infusion


by Althea Foster

### INGREDIENTS:

- 5 carrots
- 1 cucumber
- 2-3 celery stalks
- 1 Apple
- 1 beet
- 1 small piece of ginger

### DIRECTIONS:

Wash all vegetables and juice in magic bullet/juice extractor. Drink on an empty stomach or 20 minutes before eating your meals.

Juicing vegetables is a great way to get maximum nutrients into your body with the least amount of digestive effort. 





# LIVING WITH RENAL FAILURE

**H**ello, my name is Rosemary and I have been living with renal failure for 32 years and I am currently on dialysis for the last 24 years.

The kidneys are vital organs and normally you cannot survive without them. Their main function is to remove waste products from your body and to make urine. In addition to this, they help to control your blood pressure, keep your bones healthy, make red blood cells and control chemicals and fluids in your body.

When your kidneys are not working properly, there are two treatment options available to you - dialysis and kidney transplant. Living with renal failure and being on dialysis is an extremely restrictive life. I go to the hospital 3 days a week for 3 1/2 hours each session to have my blood cleaned of the toxins which are normally removed by the kidneys.

My diet is very important and I have to make sure that I am eating correctly. I am on a low protein, low potassium, low sodium, low phosphorous and very low fluid intake (only 500 mls per day) diet. I have to carefully watch what I eat because I can eat too much potassium for example and that can cause me to have a heart attack, so when I go grocery shopping, all labels are read to ensure that I am purchasing items that are low in protein etc.

Since the kidneys remove excess fluid from the body, I have to be extra careful with my fluid intake. If I drink too much, it is possible that I can drown from the excess fluid if it is not removed. My bones are affected as well. They become very brittle and I am susceptible to having natural fractures. I do not have to fall or hit my hip to break a bone, just by simply walking my bones can break.

Also I suffer from a low red blood cell count, some times I can get extremely tired but I am given meds to help with this problem. My travels are also curtailed as well. For example I just cannot get up one morning and decide I am going abroad. I have to make arrangements to have my dialysis and that is very costly.

I do not allow my renal failure to define who I am. Yes, I am on dialysis but I try to live as normal a life as I can despite my condition. Sometimes I eat things I should not (stepping out the box, that's what I call it) but I make sure that I am back in quickly.

Renal failure and being on dialysis is not a death sentence. It can be managed and managed well if you are compliant and obey your health care professionals. 